# Utility of National Spatial Data for Conservation Design Projects

Steve Williams Biodiversity and Spatial Information Center North Carolina State University

PIF CDW St. Louis, MO April 11, 2006

## Types of Data

- Biological
  - Land cover, species occurrence (surveys)...
- Physical
  - Terrain, soils...
- **♦** Climatic
  - Precipitation, temperature...

## **EROS Data Center**



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Earth Resources Observation and Science (EROS)

Products

Science

NASA LP DAAC 💂

Satellite

**NSLRSDA** 

About EROS

Image Gallery

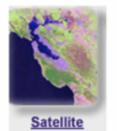


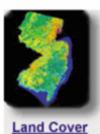
A leading source of land information for exploring our changing planet.











## **EDC Land Cover Products**

- National Land Cover Dataset 1992 (NLCD 92)
  - A U.S. land cover classification product based primarily on 1992 Landsat Thematic Mapper (TM) data.
  - 30m<sup>2</sup> cell resolution
  - 21 classes.
- Land Use and Land cover Data (LULC)
  - A global land cover database primarily derived from 1992 to 1993 1-km AVHRR data.
- AVHRR NDVI Composites
  - Weekly and biweekly NDVI composites based on 1-km AVHRR data (1980 to present).



#### National Land Cover Dataset 1992 (NLCD 1992)

**Product Description** 

View Sample Data

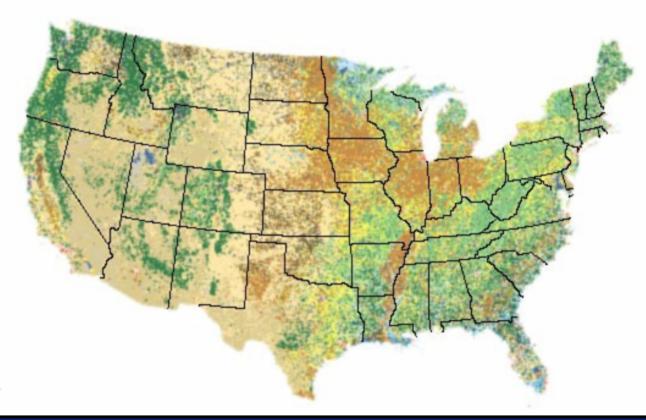
**Download NLCD Products** 

**Accuracy Assessment** 

**NLCD Land Cover Statistics** 

**Program Partners** 

Frequently Asked Questions





## **EDC Elevation Products**

### National Elevation Dataset (NED)

• Seamless 10- and 30-meter digital raster elevation data covers the conterminous U.S., Alaska, Hawaii, Puerto Rico, and Virgin Islands. Features periodic updates to incorporate the best available source data (primarily USGS 10 and 30-meter DEMs).

## Shuttle Radar Topography Mission (SRTM)

• Seamless SRTM "Finished" 1 arc second (30 meter posting) digital raster elevation covers the United States and its territories and possesions. Seamless SRTM "Finished" 3 arc second (90 meter posting) digital raster elevation covers the globe between 60 degrees N and 56 degrees S latitude. SRTM "Finished" was supplied by NGA.



### MRLC Consortium

Home

About

Products

News

FAQs

Publications

Contact

#### Shortcuts

#### **Download Data**

Land Cover (NLCD)

#### Order Imagery

MRLC 1992 MRLC 2001

#### Other Data Links

GloVis Seamless Server

#### Other Sites

EROS Data Center **EPA Geospatial** 

#### **Contact Information**

MRLC Project

Website Content

#### Multi-Resolution Land Characteristics Consortium

The Multi-Resolution Land Characteristics (MRLC) Consortium is a group of federal agencies who first joined together in 1993 (MRLC 1992) to purchase Landsat 5 imagery for the conterminous U.S. and to develop a land cover dataset called the National Land Cover Dataset (NLCD 1992), In 1999, a second-generation MRLC consortium (see logos) was formed to purchase three dates of Landsat 7 imagery for the entire United States (MRLC 2001) and to coordinate the production of a comprehensive land cover database for the nation called the National Land Cover Database (NLCD 2001).

The MRLC consortium is specifically designed to meet the current needs of Federal agencies for nationally consistent satellite remote sensing and land-cover data. However, the consortium also provides imagery and land cover data as public domain information, all of which can be accessed through this website.

#### MRLC Related News

NLCD Seamless Data Anomalies

NLCD 2001 Spatial Metadata Available

**FPA** 



NOAA



USFS



USGS





BLM



**NRCS** 



NPS



NASA



**USFWS** 



OSM





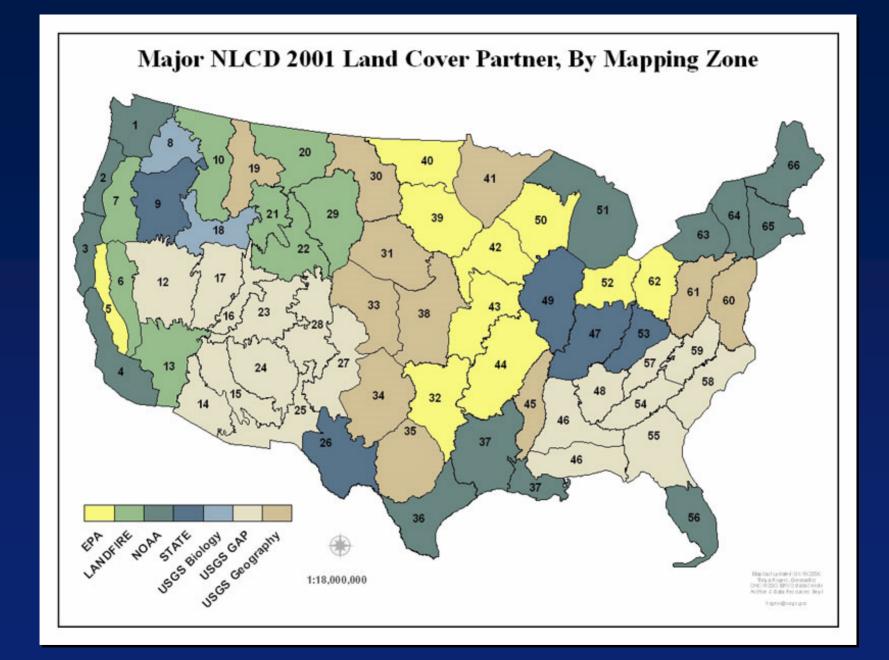
## NLCD 2001 Land Cover Class Definitions (27 classes)

- 11. Open Water
- 12. Perennial Ice/Snow
- **21. Developed, Open Space**
- 22. Developed, Low Intensity
- 23. Developed, Medium Intensity
- 24. Developed, High Intensity
- 31. Barren Land (Rock/Sand/Clay)
- 32. Unconsolidated Shore\*
- 41. Deciduous Forest
- 42. Evergreen Forest
- 43. Mixed Forest
- 51. Dwarf Scrub
- **♦ 52. Shrub/Scrub**

- 71. Grassland/Herbaceous
- ♦ 72. Sedge/Herbaceous
- ♦ 73. Lichens
- **♦** 74. Moss
- 81. Pasture/Hay
- 82. Cultivated Crops
- 90. Woody Wetlands
  - 91. Palustrine Forested Wetland\*
  - 92. Palustrine Scrub/Shrub Wetland\*
  - 93. Estuarine Forested Wetland\*
  - 94. Estuarine Scrub/Shrub Wetland\*
- 95. Emergent Herbaceous Wetlands
  - 96. Palustrine Emergent Wetland (Persistent)\*
  - 97. Estuarine Emergent Wetland\*
  - 98. Palustrine Aquatic Bed\*

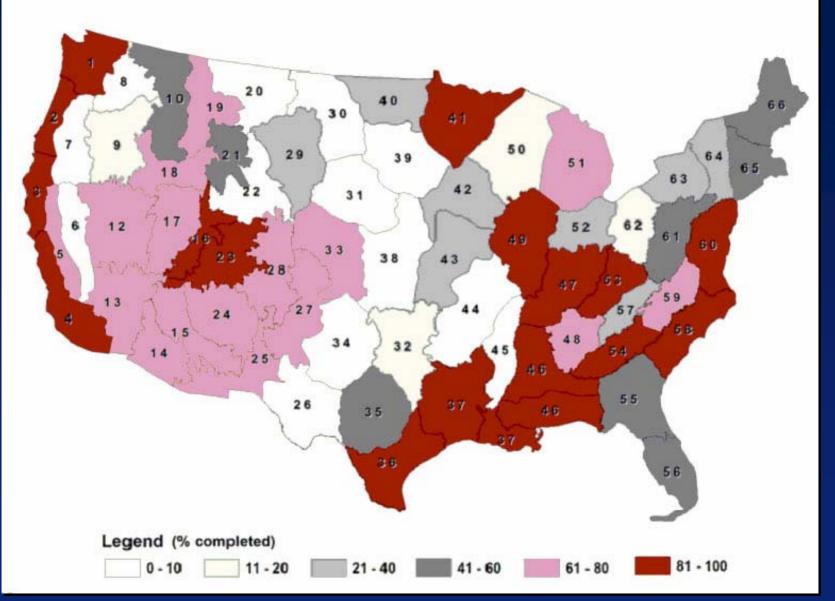




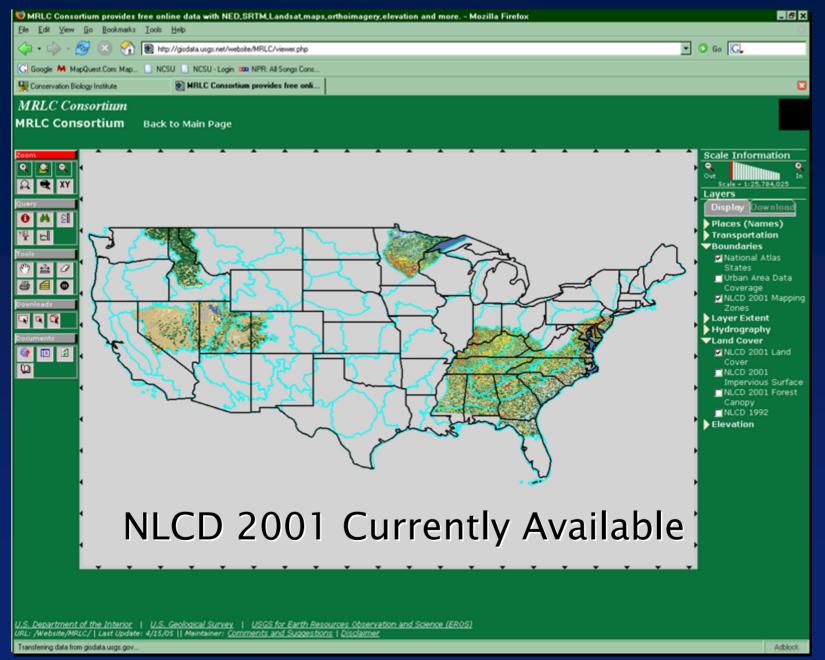




#### 2001 National Land Cover Mapping Status















National Biological Information Infrastructur

GAP Home Maps, Data & Reports

**Projects** 

Research & **Applications**  Support & Tools

#### **GAP Home**











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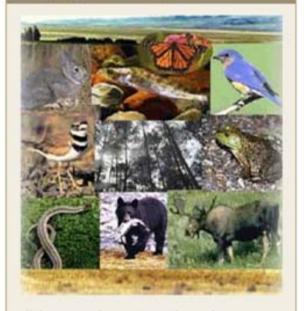
How To Conduct a Gap Analysis

#### The GAP Analysis Program

"Keeping Common Species Common"

The goal of the GAP Analysis Program is to keep common species common by identifying those species and plant communities that are not adequately represented in existing conservation lands. Common species are those not currently threatened with extinction. By identifying their habitats, GAP Analysis gives land

#### **Keeping Common Species Common**

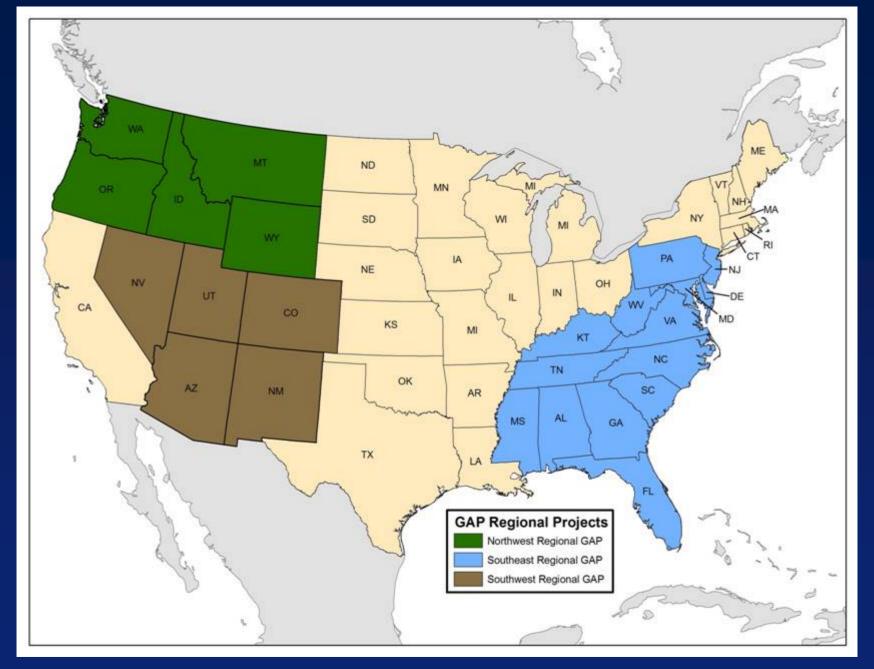


click on an image to view the interactive mapping application highlighting the species predicted habitat distribution



Red Fox, Vulpes vulpes [NBII Image Gallery]

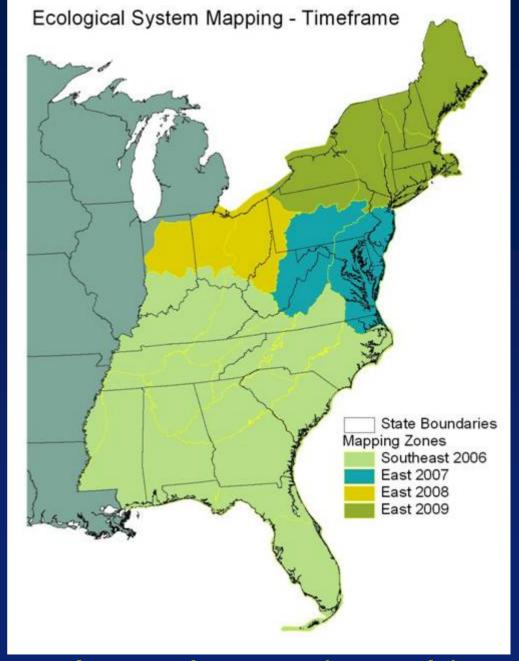






# Gap Analysis Land Cover for the Eastern US

- Based on NatureServe Ecological Systems
- 135 classes expected in Southeast
- Basis for habitat modeling for vertebrate species









About
Activities
Documents
Products
Schedule

Technology Transfer

Uses

Principal LANDFIRE Partners:

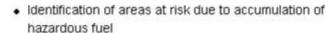
FIFE LAD

SELECTION OF THE PARTNERS OF THE PARTN

Contact Us FAQs Sitemap **LANDFIRE** is a five-year, multi-partner wildland fire, ecosystem, and wildland fuel mapping project. This project will generate consistent, comprehensive maps and data describing vegetation, fire, and fuel characteristics across the United States. These maps can assist in prioritizing and

planning hazardous fuel reduction and ecosystem restoration efforts. The consistent and comprehensive nature of LANDFIRE methods ensures that data will be nationally relevant, while the 30-meter grid resolution assures that data can be locally applicable. LANDFIRE meets agency, partner, and stakeholder needs for data to support landscape fire management planning, prioritization of fuel treatments, collaboration, community and firefighter protection, and effective resource allocation.

LANDFIRE's objective is to provide consistent, nationwide data describing wildland fuel, existing vegetation composition and structure, historical vegetation conditions, and historical fire regimes to assist:



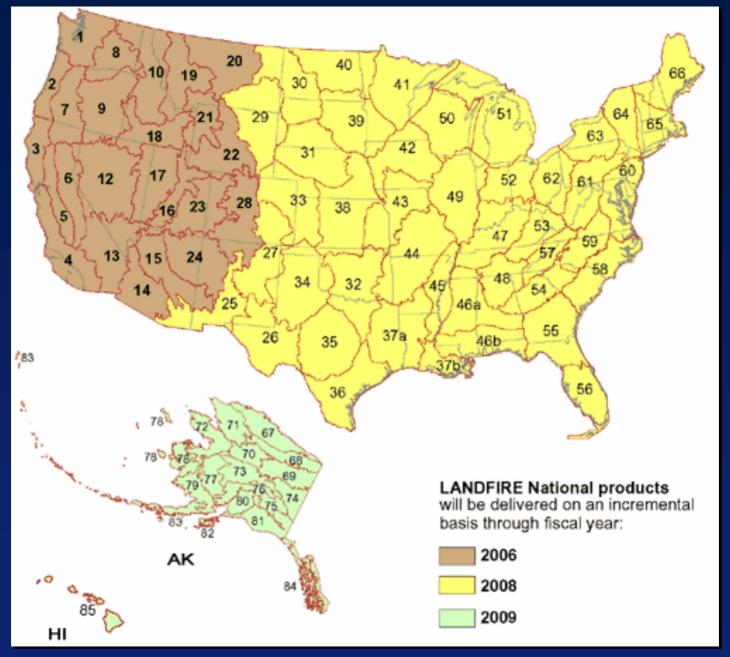
- Prioritization of hazardous fuel reduction projects
- Improvement of coordination between agencies with regard to fire and other resource management
- Modeling real-time fire behavior to support tactical decisions to ensure sufficient wildland firefighting capacity and safety
- Modeling potential fire behavior and effects to strategically plan projects for hazardous fuel reduction and the restoration of ecosystem integrity on fire-adapted landscapes



Got Data?

Find out how to share your data to ground-truth LANDFIRE maps.





## **LANDFIRE Data Products**

#### **FARSITE Fuel layers:**

- 13 Anderson (1982) Fire Behavior Fuel Models
- 40 Scott and Burgan (2005) Fire Behavior Fuel Models
- Forest Canopy Bulk Density
- Forest Canopy Base Height
- Forest Canopy Height
- Forest Canopy Cover
- Elevation
- Aspect
- Slope

#### Fire Regime layers:

- ♦ FRCC
- FRCC Departure Index Fire Regime Groups
- Mean Fire Return Interval
- Percent Low-severity Fire
- Percent Mixed-severity Fire
- Percent Replacement-severity Fire
- Succession Classes

#### **Vegetation layers:**

- Environmental Site Potential
- Biophysical Settings
- Existing Vegetation
- Existing Vegetation Height
- Existing Vegetation Cover
- Vegetation Dynamics Models

#### **Fire Effects layers:**

Fuel Loading Models



http://www.landfire.g

## **Physical**

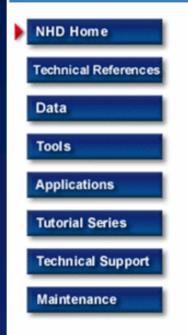


Based on
Digital Line
Graph
(DLG) data
and
EPA Reach File
(RF3) data

Initially 1:100k, but 1:24k updates are almost complete for US









Resolution Production Status

Мар.

## National Hydrography Dataset

The National Hydrography Dataset (NHD) is a comprehensive set of digital spatial data that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells. Within the NHD, surface water features are combined to form "reaches," which provide the framework for linking water-related data to the NHD surface water drainage network. These linkages enable the analysis and display of these water-related data in upstream and downstream order.

The NHD is based upon the content of USGS Digital Line Graph (DLG) hydrography data integrated with reach-related information from the EPA Reach File Version 3 (RF3). The NHD supersedes DLG and RF3 by incorporating them, not by replacing them. Users of DLG or RF3 will find the National Hydrography Dataset both familiar and greatly expanded and refined.

While initially based on 1:100,000-scale data, the NHD is designed to incorporate and encourage the development of higher resolution data required by many users.







**Natural** Resources Conservatio Service (NRCS)

**Soil Data** 



"Soil Data Viewer provides users access to interpretations and soil properties whi

shielding them from the comp



... More Info



(PDF)

## NRCS - STATSGO Database

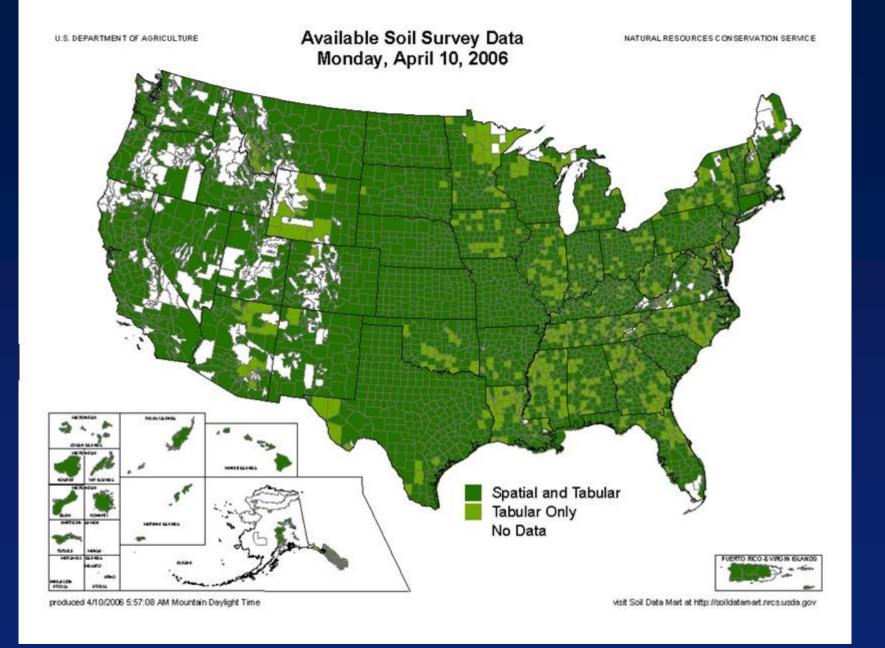
- The STATSGO database is being updated and renamed to the <u>Digital General Soil Map</u> of the United States. The update is scheduled for completion April 30, 2006.
- ♦ Scale 1:250,000

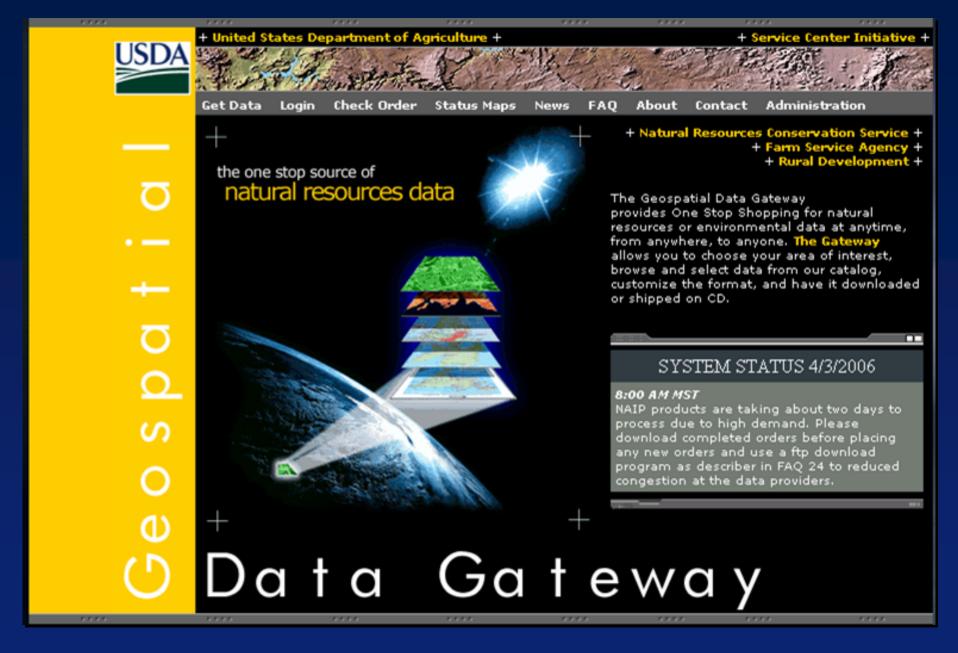


## NRCS - SSURGO Database

- Soil Survey Geographic Database
- Detailed county based soil surveys
- Completion of the SSURGO data digitizing is scheduled for 2008







## EPA Ecoregion Products



About WED What's New

Research Projects

Research Publications

How to Locate the Western Ecology Division

Links of Interest

Models, Statistical Programs & Data Sets

EPA Aquatic Resources Monitoring Web Site

Opportunities

Request a Speaker

EPA People Locator

#### U.S. Environmental Protection Agency



EPA Home > ORD > NHEERL > WED >



#### Ecoregion Maps and GIS Resources:

- <u>Level I</u>
   <u>Ecoregions</u>
- Level II
   Ecoregions
- Level III
   Ecoregions
- <u>Level IV</u>
   <u>Ecoregions</u>
- Publications
- FTP Site
- · Related Links
- Contacts

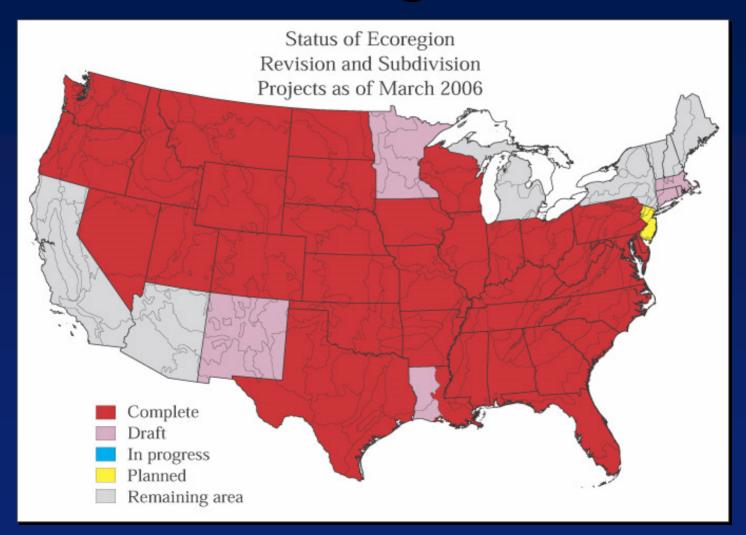
Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. By recognizing the spatial differences in the capacities and potentials of ecosystems, ecoregions stratify the environment by its probable response to disturbance. These general purpose regions are critical for structuring and implementing ecosystem management strategies across federal agencies, state agencies, and nongovernment organizations that are responsible for different types of resources within the same geographical areas.

Ecoregion Links

Ecoregion Home | Level I | Level II | Level IV | Publications | FTP Site | Links | Contacts



## Omernik Ecoregions Level 4





## **Avian Data**







#### Highlights

Search Rare Species Data by County or Watershed

More Images Than Ever

Ecological Systems Data

#### Additional Data Resources

Use our InfoNatura website to find data on the animals of Latin America.

Find more NatureServe data.

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#### An Online Encyclopedia of Life



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Welcome to NatureServe Explorer, an authoritative source for information on more than 65,000 plants, animals, and ecosystems of the United States and Canada. Explorer includes particularly in-depth coverage for rare and endangered species.



Search the database for species or ecological communities & systems.

NatureServe Explorer is a product of NatureServe and its natural heritage member programs.

You can easily find information on:

- · scientific and common names
- conservation status
- · distribution maps
- life histories, conservation needs, and more

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Website requires Internet Explorer 5.0 or Netscape 4.06 or higher .



## Birds of NA



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From the CORNELL LAB of ORNITHOLOGY and the AMERICAN ORNITHOLOGISTS' UNION

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  - Common Gordeneye
- Peregrine Falcon
- Semipalmated Sandpiper
- Ivory-billed Woodpecker
- Marbler Yellow Warbler
- Fox Sparrow

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Authors: CLAYTON M. WHITE, NANCY J. CLUM,

TOM J. CADE, W. GRAINGER HUNT

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#### Peregrine Falcon

Falco peregrinus
Order FALCONIFORMES - Family FALCONIDAE

Species Account

> References

> Sound & Video

Image Gallery

Recommended Citation

BNA No. 660

#### D Section 1 of 19

Next Section ▶

#### Section Menu:

- INTRODUCTION
- DISTINGUISHING CHARACTERISTICS
- DISTRIBUTION
- SYSTEMATICS
- MIGRATION
- **HABITAT**
- FOOD HABITS
- SOUNDS
- BEHAVIOR
- BREEDING
- DEMOGRAPHY AND POPULATIONS
- CONSERVATION AND MANAGEMENT
- APPEARANCE
- **MEASUREMENTS**
- PRIORITIES FOR FUTURE RESEARCH
- ACKNOWLEDGMENTS
- ABOUT THE AUTHORS
- OTHER NAMES
- RECOMMENDED CITATION

#### INTRODUCTION

One of the most widely distributed of warm-blooded terrestrial vertebrates, the Peregrine Falcon occurs from the tundra to the Tropics, from wetlands to deserts, from maritime islands to continental forests, and from featureless plains to mountain crags-it is absent as a breeder only from the Amazon Basin, the Sahara Desert, most of the steppes of central and eastern Asia, and Antarctica. This depth and breadth of habitat reflects a prodigiously catholic diet that includes many hundreds of species of birds, some bats, and a few rodents, and yet a commonality of ways in which Peregrines pursue them. The presence of this species in the pristine landscape has no doubt influenced the morphological and behavioral evolution of countless avian species. Even so, some populations of Peregrines are food specialists; in the Pacific Northwest, for example, enormous numbers of a few marine bird species support one of the densest-known Peregrine populations.

The often-held image of the Peregrine as a symbol of wilderness diminishes when one sees this falcon breeding on metropolitan bridges and urban skyscrapers or watches tundra migrants



+ zoom

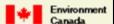
Peregrine Falcon standing on its prey, a pigeon; Jones Beach St. Pk., LI, NY; Feb.

About the photographs









#### **New Search BBS Page Help Citations Disclaimer**

#### Raw BBS Data Search Menu

Species List for a route	State Summary by year	Stop/Location by State/Route	Advanced Search
Species Totals for a route, by year		Stop/Location by FWS Region	FTP Site

Includes data through 2005.

#### These data are provisional.

Although these data have undergone editing and review, not every error has been detected and eliminated prior to posting. The BBS database is constantly being revised as additional errors are identified. Thus the same data sets retrieved on separate occasions using the interactive programs (i.e., all data retrieval options except FTP files) may have inconsistencies due to corrections made to the database in the intervening time period. Corrections are identified in the <a href="DataFix.txt">DataFix.txt</a> file located on the FTP site. Also see the database corrections txt file on the FTP site for updates regarding the FTP data files.

#### **Descriptions of Data Request Functions:**

Species List -- Returns cumulative list of bird species detected on route. Format: English common names.

Species Totals -- Returns table listing total number of individuals detected of each bird species found on route for each year the route was run. Format: English common names on left, years across top; numbers are total individuals per year; dashes indicate route was not sampled that year.

Advanced Search -- Permits small to medium sized queries of the BBS database ranging in complexity from data for a single bird species or for an entire state. Species are identified in the result sets by species identification numbers (AOU numbers), no common names are used. Weather and route history data also available via Advanced Search.

FTP Site -- Contains the entire BBS data set divided into manageable files (i.e. species groups or states). Use this site for large data requests such as an entire region or the entire BBS data set. Once at the FTP site see the "Readme.txt" file for complete descriptions of each file type.









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#### Bird Conservation

#### **Background**

NBII Bird Conservation Node

#### **Conservation Initiatives**

Institutional infrastructure of North American bird conservation

#### **Species Information**

Bird life history information along with useful identification tips and species lists

#### **Population and Habitat Data**

Links to monitoring programs, data, and mapping tools supporting bird conservation

#### **Bird Conservation Node Partners**

Agency and organization partners

#### Conferences

Conferences and meetings of interest to the ornithological community.

Current Issues: Visit the NBII
Wildlife Disease Information Node for information about Avian Influenza (Bird Flu), and West Nile Virus.

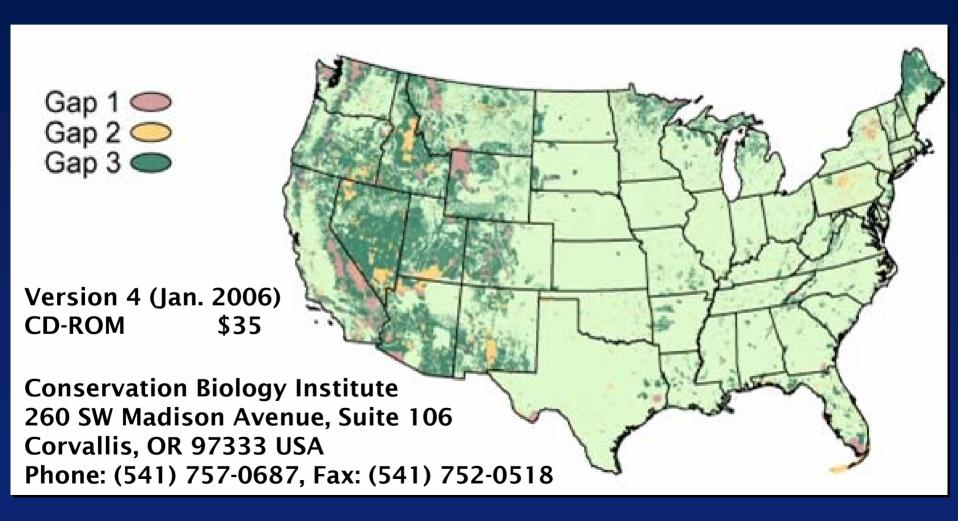




## Stewardship Data

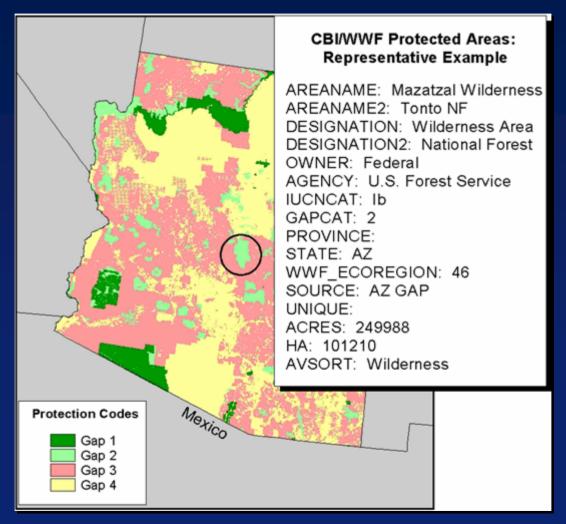


## Protected Areas Database





## Protected Areas Database





## Climatic Data



# Spatial Climate Analysis Service



SPATIAL CLIMATE ANALYSIS SERVICE



OME PRODUCTS \* PROJECTS DOCUMENTATION \* HELP \* TERMS OF USE

**Quick Links** 

1971-2000 Normals

Data Alerts! Monthly Data

Internet Map Server | Print Friendly | A A A

#### What's New!

6/14/05: New <u>Document</u> added to online documents.

5/23/05 : New Presentations available.

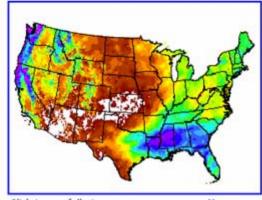
3/11/05 : Data Alerti

3/11/05 : Presentations now available! Limited but growing

Complete History

#### WELCOME TO THE SPATIAL CLIMATE ANALYSIS SERVICE!

#### Latest PRISM Data - Feb 2006



Precipitation
Max Temp
Min Temp
Dewpoint
PPT %

Click to see full-size map.

More.

#### Important notice:

These data sets have been developed through projects funded partly by the USDA Natural Resources Conservation Service, USDA Forest Service, NOAA Office of Global Programs, and others. However, there is little operational funding for maintaining and updating this web site or the data sets. They are provided as a public service for a limited time. If you find them valuable, please consider doing your part to support the SCAS. Contact us for details.

This OSU SCAS web site provides access to the highest-quality spatial climate data sets currently available. These data sets were created using the PRISM climate mapping system, developed by Dr. Christopher Daly, SCAS director. PRISM is unique in that it incorporates a spatial climate knowledge base that accounts for rain shadows, temperature inversions, coastal effects, and more in the climate mapping process.

Use this site to <u>access</u> up-to-date and historical monthly climate data sets and graphics for the US, <u>explore</u> our data online with our Internet Map Server, <u>view</u> related papers and presentations, order <u>hardcopy maps</u>, or <u>contact</u> us.

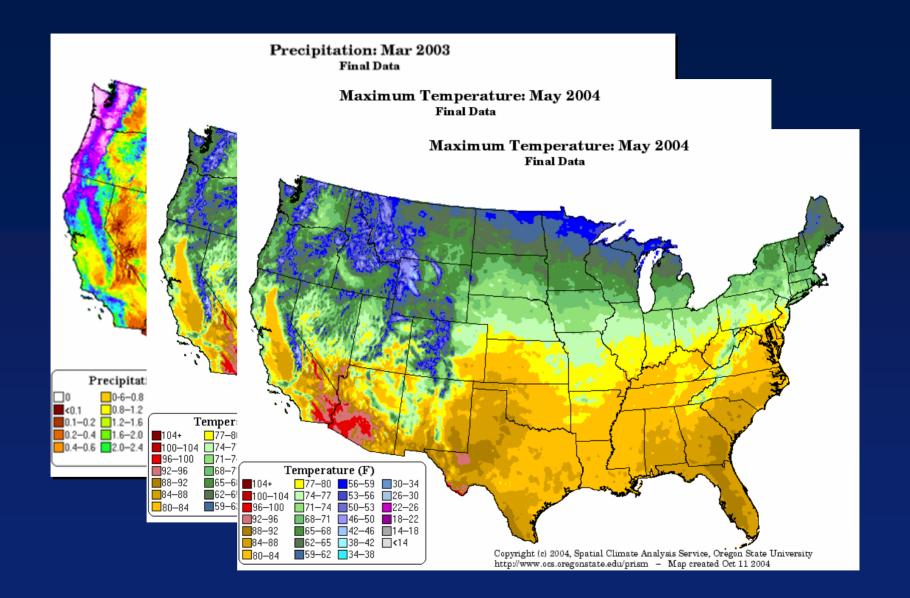
Best viewed with Internet Explorer 5.0+ or Netscape 6.0+



## Spatial Climate Analysis Service (SCAS)

- PRISM modeling
  - Parameter-elevation Regressions on Independent Slopes Model
- MapServer Explorer
- ASCII grid format
- ♦ 4km resolution
- 2km data (high resolution) available through Climate Source at http://www.climatesource.com





















## Welcome to the DAYMET U.S. Data Center - A source for Daily Surface Weather Data and Climatological Summaries

Daymet is a model that generates daily surfaces of temperature, precipitation, humidity, and radiation over large regions of complex terrain. Daymet was developed at the University of Montana, Numerical Terradynamic Simulation Group (NTSG), to fulfill the need for fine resolution, daily meteorological and climatological data necessary for plant growth model inputs

Using a digital elevation model and daily observations of minimum and maximum temperatures and precipitation from ground-based meteorological stations, an 18 year daily data set (1980 - 1997) of temperature, precipication, humidity and radiation has been produced as a continuous surface at a 1 km resolution. A wide range of summary and point daily data over the conterminous United States are now available.

No other data at this temporal and spatial resolution exists. This data is currently being distributed, free of charge, from the NTSG lab through its outreach component, the EOS Training Center Natural Resource Project.

The Daymet U.S. database is indexed by the Oak Ridge National Laboratory, Distributed Active Archive Center (ORNL DAAC), in their list of Regional and Global Data for Global Change Research



## **DAYMET**

### Daily Surface and Weather Climatalogical

#### **Summaries**

- Utilizes a digital elevation model and daily observations of minimum and maximum temperatures and precipitation to create data sets
- Temperature
- Precipitation
- Humidity
- Radiation
- 1 km resolution
- 18 year daily data set









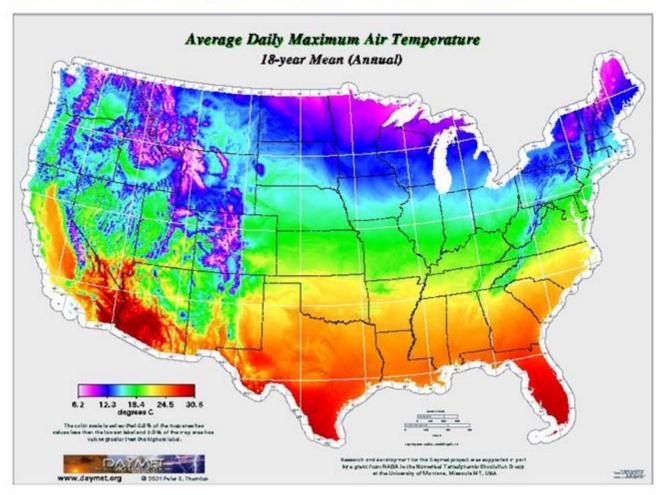












## Summary

- Lots of data out there
- Access is getting easier
- Get to know the data sets you're working with. Most have flaws – some that may be critical to your output.

"Although conceptually simple....applying the methodology can be onerous"

Shifley and Thompson

